

Appl. No. 09/975,682  
Amdt. dated November 16, 2006  
Reply to Office Action of August 23, 2006

Amendments to the Drawings:

Included in the amendment is an "Annotated Sheet Showing Changes" and a "Replacement Sheet" for Fig. 10. In Fig. 10, the numeric reference label for "To DSL Network" was incorrectly listed as 102. This typographical error has been corrected as "To DSL Network (110)" consistent with Fig. 1 and the discussion at page 4, line 3 and page 5, lines 4-5, 11-12, and 13.

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Remarks

The present amendment responds to the final Official Action dated August 23, 2006. The Examiner rejected claims 1-5, 7, 9, 11, 13, and 23-33 under 35 U.S.C. § 112 as failing to comply with the written description requirement. Claims 1-3, 9, 11, 23-26, 29, 31, and 32 were rejected under 35 U.S.C. § 102(e) based on Nordstrom et al. U.S. Patent Application Publication No. 2001/0004383 (Nordstrom). Claims 4, 5, 27 and 28 were rejected under 35 U.S.C. § 103(a) based on Nordstrom, as applied to claims 1 and 24, in view of Timm et al. U.S. Patent No. 6,055,268 (Timm). Claims 13 and 33 were rejected under 35 U.S.C. § 103(a) based on Nordstrom, as applied to claims 6 and 24, in view of Schneider et al. U. S. Patent No. 6,314,135 (Schneider). Claims 7 and 30 were objected to as being dependent upon a rejected base claim, but were indicated to be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. These grounds of rejection are addressed below.

Claims 7 and 30 have been rewritten in independent form including all of the limitations of the base claim and any intervening claims. A typographical error has been corrected in claims 7 and 30, replacing the phrase "at least on" with the phrase "at least one". Claims 9, 11, and 13 have been amended to depend from claim 7 and claims 31-33 have been amended to depend from claim 30 placing claims 7, 9, 11, 13, and 30-33 in order for allowance.

New claims 34-42 have been added. Claims 1, 2, 23-25, and 29 have been amended to be more clear and distinct. Claims 1-5, 7, 9, 11, 13, and 23-42 are presently pending.

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Amendments to the Specification:

In the paragraph beginning at page 20, line 27, the "voice transmitter controller 104C" has been corrected to the "transmitter controller 104C", to correspond to the labeling in Figs. 1 and 10 and discussion at page 21, lines 6, 10, and 17.

In the paragraph beginning at page 21, line 6, the numeric reference label for the DSL Network was incorrectly listed as 102. This typographical error has been corrected to "DSL Network 110" consistent with Fig. 1 and the discussion at page 4, line 3 and page 5, lines 4-5, 11-12, and 13.

Section 112 Rejection

The Examiner suggests that the claims contain subject matter which was not described in the specification, namely "a second pre-coding matrix at the receiver". However, "a second pre-coding matrix at the receiver" is described in great detail in the specification. Beginning on page 15, line 1 of the present invention, "The system 500 of FIG. 5 differs from the system 400 of FIG. 4 in that each of the receivers within the system 500 of FIG.5 further comprises three respective pre-coders and summing means ... In addition, the adaptation algorithms AA of the respective receivers are modified to enable to adaptation of pre-coder matrix or matrices for the receiver pre-coders, such that in a training mode the receiver may itself rapidly determine at least an initial, if not optimal, pre-coder operating parameter set for the transmitter side pre-coders." These pre-coders are described in further detail on pages 15-17, such as, page 16, lines 12-18. That description includes operating equations, such as, equations 8-12 on page 17. As supported

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in the specification and claimed in claims 1 and 23, a method and apparatus, respectively, are described for "receiving from the first communication channel, the matrix updating information computed at a first receiver on the other end of the first communication channel, the matrix updating information having been computed utilizing the transmitted first pre-coded training signal and a second pre-coding matrix located at the first receiver". "The second pre-coding matrix responsive to a second pre-coded training signal from at least a second receiver" as claimed is clearly supported and described in great detail in the specification and figures.

Claim 24 also claims the use of two pre-coding matrices, one located in a transmitter and one located in a receiver, the pre-coding matrix in the receiver "responsive to a second pre-coded training signal from at least a second receiver", and the use of first and second pre-coded training signals which are supported by the specification as described above.

#### Claims 7 and 30 Objections

Claims 7 and 30 have been rewritten in independent form including all of the limitations of the base claim and any intervening claims. A typographical error has been corrected in claims 7 and 30, replacing the phrase "at least on" with the phrase "at least one". Claims 9, 11, and 13 have been amended to depend from claim 7 and claims 31-33 have been amended to depend from claim 30 placing claims 7, 9, 11, 13, and 30-33 in order for allowance.

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### The Art Rejections

As addressed in greater detail below, Nordstrom, Timm, and Schneider do not support the Official Action's reading of them and the rejections based thereupon should be reconsidered and withdrawn. Further, the Applicant does not acquiesce in the analysis of Nordstrom, Timm, and Schneider made by the Official Action and respectfully traverses the Official Action's analysis underlying its rejections.

Nordstrom relates to a far-end cancellation circuit for a transmission system. The Examiner suggests that Nordstrom uses signals  $R_k$  and  $\hat{S}_k$  provided at the NT side and the signal  $\hat{S}_k$  reads on "a second pre-coding matrix in each receiver". Even though the Examiner recognizes that Nordstrom does not mention a pre-coded training signal, he suggests that Nordstrom requires the use of  $R_k$  as a training signal. This is not the case. In Nordstrom's paragraphs [0036] and [0037] the signals  $\hat{S}_k$  and  $R_k$ , neither of which are specifically defined, are used in an equation to calculate an error. This error function of Nordstrom is not defined in detail and does not inherently have the definition suggested by the Examiner. Rather, alternative meanings could be assumed for  $\hat{S}_k$  and  $R_k$  for the generation of an error as part of an adaptive algorithm not requiring a pre-coded training signal. Further, Nordstrom's error equation is not inherently equivalent to the function of the present invention as claimed.

In contrast to Nordstrom, as described in text and in Fig. 5 of the present invention, the pre-coding matrices in the receivers have the same form as the pre-coding matrices in the transmitters. The "initial pre-coder parameters are determined at each receiver based upon the reception of a predetermined training sequence, per Fig. 5. After the initial pre-coder parameters

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are determined, the determined parameters are provided to the respective transmitters, where they are incorporated into the transmitter side pre-coder functions." See page 16, lines 12-17 of the present invention, for example. By not defining the signals  $\hat{S}_k$  and  $R_k$  and not discussing processing training data signals in a transmitter utilizing an initial pre-coding matrix to produce a first pre-coded training signal, Nordstrom provides no basis of support for matrix updating information having been computed utilizing the transmitted first pre-coded training signal and a second pre-coding matrix located at the first receiver, the second pre-coding matrix responsive to a second pre-coded training signal from at least a second receiver and updating said initial pre-coding matrix based on said matrix updating information as presently claimed in claims 1 and 23. Claim 24 distinguishes from Nordstrom in the same manner as claims 1 and 23.

Nordstrom does not process training data signals in a transmitter utilizing an initial pre-coding matrix to produce a first pre-coded training signal. Nordstrom does not transmit the first pre-coded training signal to a first communication channel. Nordstrom does not receive matrix updating information from the first communication channel. The matrix updating information computed at a first receiver on the other end of the first communication channel utilizing the transmitted first pre-coding training signal and a second pre-coding matrix located at the first receiver. The second pre-coding matrix responsive to a second pre-coded training signal from at least a second receiver. Nordstrom also does not update said initial pre-coding matrix based on said matrix updating information. Nothing in Nordstrom teaches or makes obvious methods or an apparatus as presently claimed. The claims are not taught, are not inherent, and are not obvious in light of Nordstrom.

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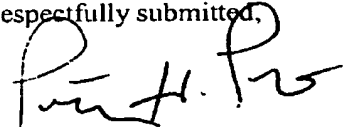
New independent claim 38 and dependent claims 39-42 have been added. Claim 38 distinguishes from Nordstrom in the same manner as claim 23.

Since dependent claims 2-5, 9, 11, 13, 25-29, 31-37, and 39-42 depend from and contain all the limitations of the corresponding base claims, claims 2-5, 9, 11, 13, 25-29, 31-37, and 39-42 distinguish from the references in the same manner as the base claims and place claims 1-5, 7, 9, 11, 13, and 23-42 in order for allowance.

#### Conclusion

All of the presently pending claims, as amended, appearing to define over the applied references, withdrawal of the present rejection and prompt allowance are requested.

Respectfully submitted,



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